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ABSTRACT

Results are presented that were obtained from application of the defined methodology to the 1972-73 operating budget of McMaster University. Programs were defined as instructional (degree) programs, research programs, and professional activities/public service programs. The calculation of program costs requires that crossovers be made from the university's accounting system to the individual programs. Tabular results of the expenditure analysis are provided for (1) comparison of the relative costs of academic degree programs as reflected in the Ontario Ministry of Colleges and Universities operating-formula weights, with the weights applicable at McMaster, and (2) a summary of the costs that were allocated to research activities not directly related to instructional activities and that are not financed by sponsored research funds. (LBH)

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Assistant to the President -

Special Projects*

McMaster University

Hamilton, Ontario

February 20, 1974

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OIR-29

McMASTER UNIVERSITY
EXPENDITURE ANALYSIS 1972-73
AND AN AFTERWARD
(November 1975)

*Formerly called the Office of Institutional Research

HE 008382

FOREWORD

This report is a companion to OIR-21-1 (Methodology for Expenditure Analysis) and reports the results of the application of the methodology outlined therein to the 1972-73 operating budget of the University, excluding the Division of Health Sciences.

Copies of OIR-21-1 may be obtained from the Office of the Assistant to the President-Special Projects, Gilmour Hall 110B.

The Expenditure Analysis was conducted under the guidance of a Steering Committee chaired by Dr. D. R. McCalla and composed of the following members: Dr. A. N. Bourns, Dr. D. A. Dawson, Mr. J. P. Evans, Dr. S. J. Frankel, Mr. D. M. Hedden, Dr. W. F. Hellmuth, Dr. E. C. Higbee, Mr. B. R. James, Dr. A. A. Lee/Dr. L. King, Mr. W. J. McCallion, Dr. R. C. McIvor/Dr. B. A. W. Jackson, Dr. A. G. McKay/Prof. A. Berland, Dr. W. J. Schlatter/Dr. R. Joyner, Dr. L. W. Shemilt, and Mr. M. Zack.

The technical aspects of the study were carried out by Messrs. N. F. Pardasani, R. L. Robertson, and S. F. Semenluk.

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McMASTER UNIVERSITY
EXPENDITURE ANALYSIS 1972-73

Introduction

This report is a companion to OIR-21-1¹. It presents the results obtained from application of the defined methodology to the 1972-73 operating budget of the University. For purposes of this study, programs were defined as instructional (degree) programs, research programs, and professional activities/public service programs. The Health Sciences, Divinity College, and non-degree extension programs were not included in this analysis.

The calculation of program costs requires that "crossovers" be made from the University's accounting system to the individual programs. These "crossovers" are not based on a direct one-to-one relationship and, therefore, numerous assumptions must be made when selecting the bases for allocating the expenditures recorded in the traditional University departmentalized accounts.

Since the study began early in the 1972-73 fiscal year, the methodology was applied to the budgeted expenditures rather than the actual expenditures for the year. However, total budgeted expenditures differed from actual expenditures by less than .5%.

The expenditure analysis excluded programs and direct expenditures applicable to Health Sciences, Divinity College and non-degree extension. The indirect expenditures, eg. Administration, applicable to these areas were excluded from the study as well.

Results of the study should be interpreted in the light of the assumptions made, the difficulties inherent in the gathering of source data and the degree of subjectivity involved in completion of Faculty Activity Analysis forms and in application of the methodology. Therefore, the results should be interpreted in their "relative" sense rather than to ascribe decimal-point precision to them.

¹ McMaster University, Methodology for Expenditure Analysis, OIR-21-1 (Hamilton, Ontario: Office of Institutional Research, McMaster University, March 19, 1973).

METHODOLOGY

Each student entering the University comes into contact with the various academic and support activities provided by the University in order to complete the requirements for his chosen academic degree program. With each contact, the student has exhausted some of the resources allocated to that activity by the University and it is the accumulation of the expenditures on these resources that measure the cost of the various degree programs. Figure 1 graphically depicts the process which the methodology for this study addressed.

OIR-21-1 describes the general methodology followed in the Analysis while the Appendix of this report describes the specific methodology used. Simply stated, expenditures of academic departments were allocated to academic activities on the basis of time-distributions obtained from Faculty Activity Analysis forms which were completed by the chairman of each department; expenditures for academic activities were then allocated to degree programs on the basis of course units generated by each degree program in each academic department. Support activities expenditures were allocated to degree programs on the basis of program enrolments.

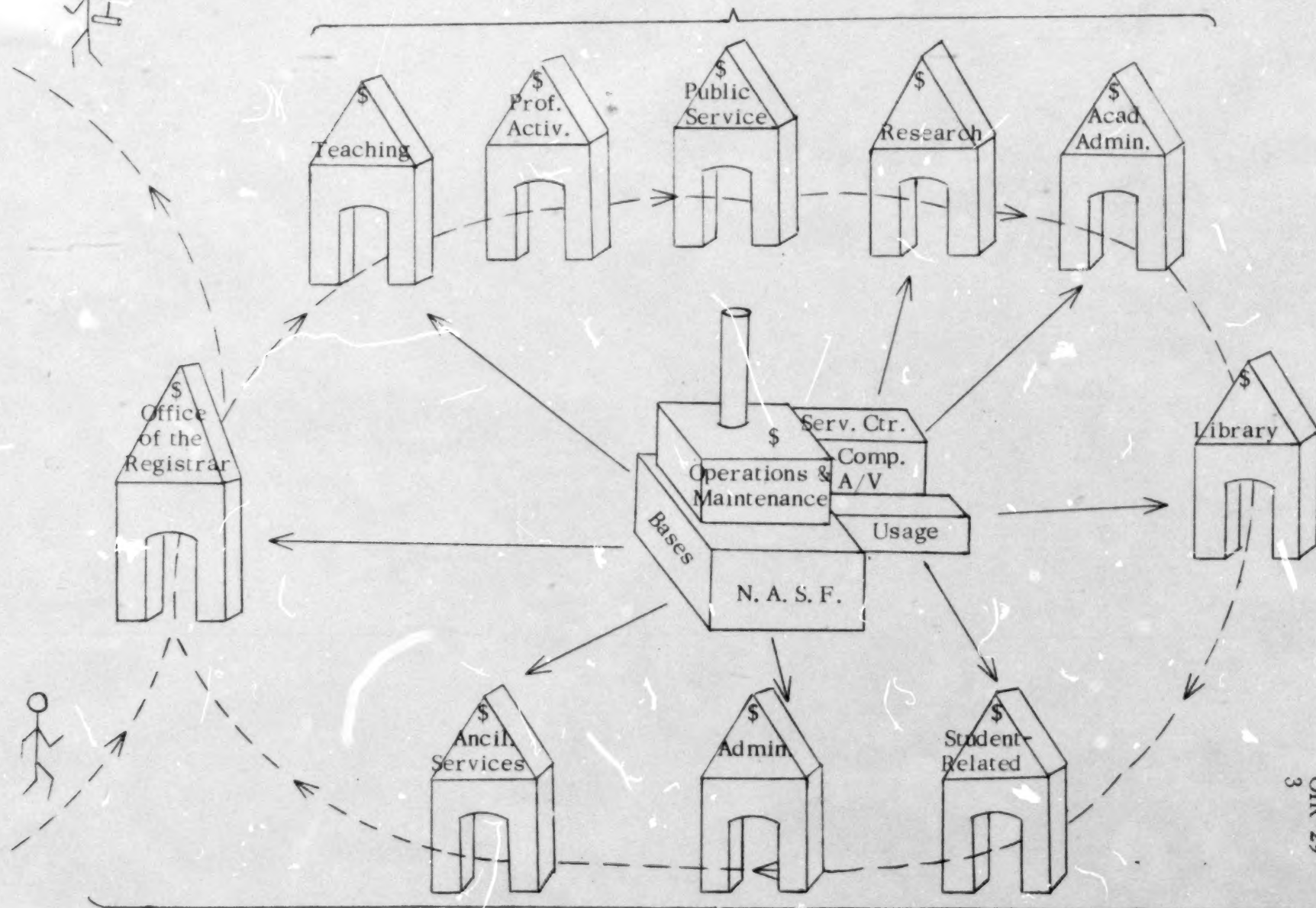
Selected sensitivity testing was performed to ascertain the sensitivity of program expenditures to various allocation procedures, particularly in the areas of Library expenditures and research expenditures. These tests indicated that results were not significantly affected by the changes in method.

RESULTS

The results of the expenditure analysis are presented in Table I and II. Table I compares the relative costs of academic degree programs as reflected in the Ontario Ministry of Colleges and Universities operating-formula weights with the weights applicable at McMaster. Table II presents a summary of the costs which were allocated to research activities not directly related to instructional activities and which are not financed by Sponsored Research funds.

ACADEMIC ACTIVITIES

Academic Department Expenditures Allocated to Activities Using Faculty Activity Analysis Forms and then to Programs via Course Units



SUPPORT ACTIVITIES

Allocated to Program Costs on Basis of Enrolments

The weights for McMaster programs shown in Table 1 are based on total costs, excluding costs funded by Sponsored Research. Expenditures of University funds on research programs and professional activities/public service programs have been included in arriving at the weights shown. The results are not static and should not be used indiscriminately in projections as they are subject to change with fluctuations in number of students and/or changes in student mix.

Table II shows a relationship between Sponsored Research expenditures and the component costs of McMaster University research expenditures not directly associated with instruction. If the reader accepts the assumption that University costs of research (which does not involve graduate students) are related to Sponsored Research activities, then data reported in Table II may be used as a measure of overhead rates applicable to Sponsored Research in Science and Engineering.

This study has provided the University with relevant expenditure data which it may use in discussions with CUA regarding financing of University operations. It has also brought into focus program cost relationships which may be useful in future academic planning discussions.

Enquiries regarding the study should be directed to the Office of Institutional Research, Room 228, Gilmour Hall.

McMaster University
1972-73 Expenditure Analysis (Using December 31, 1972 Budget Data)
Comparison of Existing MCU Weights with Equivalent McMaster Weights
(Weight of 1.0 = \$1765 = Value of B. I. U.)

MCU Program	MCU Weights			McMaster Weights		
	Masters	2nd Stage Doctoral	Weighted Average ¹	Weighted Average ¹	Masters	2nd Stage Doctoral
UNDERGRADUATE:						
Arts Gen & Hons 1			1.0	1.3		
Arts Upper Yr Hons			1.5	1.6		
Commerce & Bus Admin			1.5	1.3		
Engineering			2.0	2.4		
Fine Arts & Appl Arts			1.5	1.9		
Music			2.0	2.1		
P/Ed & Health Ed			1.5	1.5		
Sci Gen & Hons 1			1.0	1.5		
Sci Upper Yr Hons			2.0	1.9		
Social Work			1.0	1.6		
Total Undergraduate			1.4	1.6		
GRADUATE:						
Commerce & Bus Admin	3.0	6.0	3.0	2.8	2.8	-
Engineering	4.0	6.0	4.8	5.8	6.4	5.0
Humanities	3.0	6.0	4.1	3.9	4.7	2.5
Mathematics & Appl Math	3.0	6.0	4.4	4.2	4.4	4.0
Physical & Biol Sci	4.0	6.0	5.4	5.5	6.8	5.0
Soc Sci & Other	3.0	6.0	4.5	3.7	4.0	3.4
Total Graduate	-	-	4.5	4.4	-	-

¹Based on 1972-73 Student Enrolment mix.

Table No. 1
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McMaster University
1972-73 Expenditure Analysis (Using December 31, 1972 Budget Data)
Summary of University Research Expenditures by Category

Faculty	Sponsored Research	Research Costs Other Than Academic Salaries						Acad Sal & F. B. Expense	Superv'n of P. D. F.'s		Total Univ Research
		Service Centres	O & M Allocation	Admin Overhead	Library	Dept'l Other Expense	Total		Acad Sal & F. B. Expense	Dept'l Other Expense	
Science	\$ 2864482	328588	203189	177036	245192	261796	1215801	1588488	67627	23593	2695509
% of Sponsored Research	<u>100.0</u>	<u>11.5</u>	<u>7.1</u>	<u>6.2</u>	<u>8.5</u>	<u>9.1</u>	<u>42.4</u>	<u>48.5</u>	<u>2.4</u>	<u>.8</u>	<u>94.1</u>
Engineering	\$ 1437763	120956	63307	88863	72447	70255	415828	4,0256	29777	12078	867939
% of Sponsored Research	<u>100.0</u>	<u>8.1</u>	<u>4.4</u>	<u>6.2</u>	<u>5.0</u>	<u>4.9</u>	<u>28.9</u>	<u>28.5</u>	<u>2.1</u>	<u>.8</u>	<u>60.3</u>
Total - Arts, Sciences & Engineering	\$ 4528996	480272	266496	287682	557477	434180	2026107	3156909	99651	36076	5318743
	<u>100.0</u>	<u>10.6</u>	<u>5.9</u>	<u>6.3</u>	<u>12.3</u>	<u>9.6</u>	<u>44.7</u>	<u>69.7</u>	<u>2.2</u>	<u>.8</u>	<u>117.4</u>

APPENDIX I

Summary of Allocation Methodology

Budget Category	Budget Item	Allocation Recipient	Allocation Basis	Comments
I. Instruction--Salaries	Departmental Academic Salaries	Department Faculty activities	Department Faculty Activity Analysis (FAA)	Applicable salary transfers were made for inter-departmental servicing.
	Departmental Support Staff Salaries	Department Faculty activities	Department Faculty Activity Analysis (FAA)	
	Division & Faculty Academic Salaries	(a) Direct Instruction--allocated to applicable departments and their faculty activities, excluding research, professional activities and public service (b) Academic Administration	Department Faculty Activity Analysis (FAA) FTE enrolment by department and student type	Determined from Departmental FAA's and accounting records. Salaries summarized and distributed on the basis of being divisional or faculty; and within faculty, as applicable to undergraduate, graduate, or both.

Appendix (Continued)

Budget Category	Budget Item	Allocation Recipient	Allocation Basis	Comments
i. Instruction--Salaries (Cont'd,)	Division and Faculty Support Staff Salaries	Academic Administration	FTE enrolment by department and student type.	Salaries summarized and distributed on the basis of being divisional or faculty; and within faculty, as applicable to undergraduate, graduate, or both.
	Graduate Studies Office Salaries	(a) Direct Instruction--allocated to applicable departments and their faculty activities, excluding research, professional activities and public service (b) Academic Administration	Department Faculty Activity Analysis (FAA). Graduate Student units by department.	Determined from Departmental FAA's and accounting records. Resulting units generated by the Instructional Workload Matrix (IWLMI)
	Part-Time Degree Salaries	Part-Time Degree	Direct allocation.	Considered to be a department.
	Summer Stipends and Grants in Aid	University Research	Actual stipend payments for the year 1972-73 by department.	
	Moving and Recruiting Expense	Academic Administration	FTE enrolment by department	Distributed as a divisional "overhead" expense since actual expenditures by department vary from year to year.

Appendix (Continued)

Budget Category	Budget Item	Allocation Recipient	Allocation Basis	Comments
2 Instruction--Other	Direct Instruction--Departmental Expense	Department faculty activities, excluding research, professional activities, and public service.	Department Faculty Activity Analysis (FAA)	Expenses specifically directed to undergraduate and/or graduate instruction were applied as such.
	Special Instruction--Other	Department faculty activities, excluding research, professional activities, and public service.	Distributed to departments on the basis of their direct departmental expenses (salaries and other expenses). Within department, the department FAA provided the allocation base.	A special contingency fund applicable to both academic divisions
	Graduate Studies--Other	Academic Administration	Graduate student units by department.	Resulting units generated by the Instructional Workload Matrix (IWM)
	Part-Time Degree--Other	Part-Time Degree	Direct allocation.	Considered to be a department.
3 Instruction--Graduates	Graduate Student Support	(a) Graduate Instruction (b) Undergraduate Instruction--Years 1 to 4.	Undergraduate Instruction cost was calculated for each academic department by applying the maximum allowed assistantship support of \$1800 against total number of full-time graduates registered in each department. Graduate instruction cost became the balance of	Budget Represents "net" cost of Graduate Support, after recoveries from Sponsored Research Grants. Graduate Support paid through the grants was <u>not</u> removed from Sponsored Research and was <u>not</u> included as part of Graduate Instructional costs.

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Appendix (Continued)

Budget Category	Budget Item	Allocation Recipient	Allocation Basis	Comments
3. Instruction--Graduates (Cont'd.)			support funds remaining after the Undergraduate allocation. Undergraduate Instruction costs were allocated to Years 1 to 4 on the basis of data supplied on FAA's study made by Graduate Studies Office and departmental student assignment lists.	
4. Services	Audio-Visual	Department faculty activities, excluding research, professional activities, and public service.	Distributed to departments on the basis of actual Audio-Visual user costs for the year 1972-73. Within department, the Department FAA provided the allocation base.	O & M allocation to the Audio-Visual department was included in the amount distributed.
	Telephone Equipment-- Instructional Departments	Department faculty activities, excluding research, professional activities, and public service.	Distributed to departments on the basis of a sampling of actual usage in the year 1972. Within department, the department FAA provided the allocation base.	

Appendix (Continued)

Budget Category	Budget Item	Allocation Recipient	Allocation Basis	Comments
4. Services (Cont'd)	Computer Centre (CDC 6400)	(a) Graduate Instruction (b) Undergraduate Instruction--Years 1 to 4 (c) University Research (d) University Administration	Allocated to departments on the basis of actual user charges for the year 1972-73. Within department, allocation recipients (a) and (c) are direct allocations; and recipient (b) was allocated per the department FAA. Recipient (d) was not departmentalized but aggregated with University Administration.	The amount distributed is net of recoveries and includes the O & M allocated to the Computer Centre for the Senior Science installation.
	Director & Assistant Director--Planning & Construction	University Administration	Direct allocation.	
	Health Physics & CARED	University Research	Direct allocation.	
5. Library	Books, Periodicals, General Expense, Cataloguing, Acquisitions, and Serials	Department "activity cost centre: Library."	The Arts Division acquisitions budget by department, was used as the allocation basis for the Mills Library budget items. The Science & Engineering acquisitions budget by department, was used for the Science Library budget items.	

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Appendix (Continued)

Budget Category	Budget Item	Allocation Recipient	Allocation Basis	Comments
5. Library (Cont'd.)	Circulations & Stacks	Program "activity cost centre: Library."	Distributed direct to program based on actual circulation statistics for the year 1972.	Statistics generated by the Library computer system.
	Reference	Department "activity cost centre: Library."	Undergraduate and graduate student units by department.	Resulting units generated by the Instructional Workload Matrix (IWL.M).
	Special Collections	Department "activity cost centre: Library."	Undergraduate and graduate student units by department.	Resulting units generated by the Instructional Workload Matrix (IWL.M).
	Inter-Library Loans	Department "activity cost centre: Library."	Graduate student units by department.	Resulting units generated by the Instructional Workload Matrix (IWL.M).
	Archives	Department "activity cost centre: Library."	Graduate student units by department.	Resulting units generated by the Instructional Workload Matrix (IWL.M).
	Documents	Department "activity cost centre: Library."	Student units for 3rd and 4th year Social Science, Business, and Graduate.	Resulting units generated by the Instructional Workload Matrix (IWL.M).
	Reading Room Services	Department "activity cost centre: Library."	Undergraduate student units--Arts Division.	Resulting units generated by the Instructional Workload Matrix (IWL.M).
	Maps	Department "activity cost centre: Library."	Student units for specific user departments (Geography, Geology, etc.)	Resulting units generated by the Instructional Workload Matrix (IWL.M).

Appendix (Continued)

Budget Category	Budget Item	Allocation Recipient	Allocation Basis	Comments
				NOTE: O & M expense allocated to the Library was distributed to the departments as follows: Mills: IWLM units for the Arts Division Science: IWLM units for the Sci & Eng Division.
6. Maintenance	Direct Expenses (salaries, fringe benefits, etc.)	Initial allocation--direct to each building as budgeted.	Direct allocation.	
	Cooling Expense	Allocated initially to buildings.	Allocation based on the actual chilled water distribution for 1971-72.	Actual distribution for 1972-73 not available. Estimate included for Life Sciences.
	Undistributed Building Maintenance, Office of Assistant Director, Garage, Office Services and Computer Services	Allocated initially to buildings.	Net Assignable Square Feet (NASF) by building.	Major building exclusions included MUMC, Divinity College & Teachers' College.
	Custodial	Allocated initially to buildings.	Net Assignable Square Feet (NASF) by building.	Major building exclusions included the above, plus Residences & Food Services.

Appendix (Continued)

Budget Category	Budget Item	Allocation Recipient	Allocation Basis	Comments
Maintenance (Continued)	Heat	Allocated initially to buildings.	Net Assignable Square Feet (NASF) by building.	Major building exclusions included MUMC, Residences, & Food Services.
	Hydro & Water	Allocated initially to buildings.	Net Assignable Square Feet (NASF) by building.	Major building exclusions included MUMC, Teachers College, Residences, & Food Services.
	Grounds	Allocated initially to buildings.	Net Assignable Square Feet (NASF) by building.	Major building exclusions included MUMC & Divinity College.
	Receiving & Stores	University Administration	Direct allocation.	
	Utility Plant--Liquid Nitrogen	University Research	Direct allocation.	

The final allocation to Department "activity cost centre: Operations & Maintenance" was achieved in the following manner:

1. O & M expenses allocated to Central Utilities, Campus Services and General Buildings were redistributed back to the Other University buildings.
2. The aggregated O & M expenses by building were then distributed to all University departments based on the NASF by department and building.
3. The O & M allocation to academic departments was adjusted upward to compensate the Office of the Registrar for the O & M expense incurred in instructional space under his control. This adjustment was based on actual room utilization by department for the year 1972-73. Where maximum utilization was not achieved, the unused portion was deemed to be University "overhead" and was distributed to all academic departments on the basis of their existing O & M allocation exclusive of Research Labs.

Appendix (Continued)

Budget Category	Budget Item	Allocation Recipient	Allocation Basis	Comments
6. Maintenance (Cont d.)				
4. The O & M allocation to academic departments was summarized and allocated as follows: Research (O & M expense applicable to Faculty Labs.) O & M: Graduate (O & M expense applicable to Graduate Offices and Labs.) O & M: Undergraduate (O & M expense applicable to Undergraduate Labs.) O & M: Graduate & Undergraduate (Balance of O & M expenses). 5. The O & M allocation to non-academic departments was "folded back" into their associated "activity cost centre" (Library, University Administration, Academic Administration, Student-Related Services, etc.). 6. The O & M allocation to Academic Administration was redistributed back to the academic departments by using the student units generated by the IWLM. This distribution took into account the type of student: that is, graduate and undergraduate.				
7. Administration and General Expenses	This category is exclusive of Academic Administration resulting from the departmental FAA's. The budget items include University Administrative units (Business Office, Personnel, etc.); and certain Academic Administrative units of a university-wide nature (Office of the Registrar, Convocation and Exams, etc.)	1. University Research	Aggregated Sponsored Research, by department.	Transfers from O & M. Student Services, Service Centres, are included. University Research represents direct administration (salaries) and administrative overhead which is based on the ratio of Sponsored Research expenditures to Sponsored Research plus Operating expenditures.
		2. Program "activity cost centre: Administration."	FTE enrolment by program.	

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Appendix (Continued)

Budget Category	Budget Item	Allocation Recipient	Allocation Basis	Comments
8. Student Services & University Scholarships	The budget items include the Deans of Students, Men & Women; Student Health; etc.	Program "activity cost centre: Student-Related Services."	FTE enrolment by program	Transfers were made to Administration and from O & M prior to the final distribution.
9. Ancillary	The budget items include Food Services, Bookstore, etc. (represents operational deficit).	Program "activity cost centre: Ancillary."	FTE enrolment by program.	A transfer was made from O & M prior to the final distribution.
10. Research--(not budgeted)	Sponsored Research	Aggregated research expenditures by department.	Direct allocation based on an analysis of accounting records (214 accounts).	

McMASTER UNIVERSITY
EXPENDITURE ANALYSIS 1972-73:
AN AFTERWORD

Introduction

Since the publication of OIR-29¹ a number of queries have been made about the results of McMaster's 1972-73 expenditure analysis and the uses to which they can be put. Care must be taken when interpreting the results in order to arrive at correct conclusions about them. Four areas in particular must be clearly understood before using the data from the study:

1. The costs are historical costs and represent a particular mix of students in a particular year.
2. Because of the assumptions inherent in the cost allocation procedures used to derive the weights the resultant costs should be interpreted as relatively correct rather than precisely correct.
3. The omission of Health Sciences from the study may create a false impression of the costliness of non-professional undergraduate programs relative to the professional and graduate programs.
4. The difference in McMaster and M.C.U. weights represent a series of policy decisions to allocate resources in certain ways.

This report will explore these four² areas and reiterate the cautionary remarks made in OIR-21-1² and CIR-29³.

¹McMaster University, McMaster University Expenditure Analysis 1972-73, OIR-29 (Hamilton, Ontario: Office of Institutional Research, McMaster University, February 20, 1974).

²McMaster University, Methodology for Expenditure Analysis, OIR-21-1 (Hamilton Ontario: Office of Institutional Research, McMaster University, March 19, 1973) pp. 2-4

³McMaster University Expenditure Analysis, pp. 1-2.

1. The costs are historical costs and represent a particular mix of students in a particular year.

The 1972-73 expenditure analysis used budgeted expenditures for that year, that is, it gave a snap-shot presentation of the costs of academic programs for that period. No attempt was made to define cost standards. Indeed, the analysis did not attempt to show that these costs represented the best allocation of resources, nor that a particular program required a certain optimal level of funding, namely the McMaster level. The costs determined were historical costs, those expenditures incurred by academic programs in 1972-73.

The student mix and faculty data used to derive the cost per program was data pertinent to 1972-73. Shifts in student mix, which could in turn cause changes in faculty time apportioned to research and instruction, could result in significant changes in the costs for academic programs. While the weights given in OIR-29 are full costs, i.e., they include research and administrative overhead, a change in student mix could create higher costs for some programs while lowering the costs of others. In the 1973-74 expenditure analysis, just such a phenomenon occurred: costs of certain programs increased because of changes of student numbers and mix. The overall costs to the university, however, stayed relatively stable.

Thus, it is a fallacy to look at the McMaster weights as standard weights. Because they represent particular costs for a particular group of students in the designated year, they show the way in which McMaster chose to allocate its funds in 1972-73. Any attempt to generalize these weights to another institution without first duplicating McMaster's expenditure analysis can lead to erroneous conclusions.

2. Because of the assumptions inherent in the cost allocation procedure used to derive the weights the resultant costs should be looked upon as relatively correct rather than precisely correct.

Allocations of costs other than salaries and direct charges to departments are accomplished through the use of physical bases such as full-time-equivalent students, student units or net assignable square feet. Such allocation procedures posit only a single variable for cost incurrence and the possibility of multiple causation of costs is not considered.

Also, the fact that certain overhead costs are fixed, that is, that they would continue to be incurred even under minimal operating conditions suggests that the assumption that these costs vary with some physical measure may be an arbitrary one. The application of these costs by similar allocation bases, however, provides an output cost (cost per academic program) which is consistent throughout all university departments. While the variable cost per program is a number easily computed, the full cost per program is less precise in absolute dollars and cents.

The McMaster weights for the 1972-73 cost study are therefore a relative and not a precise measure. They represent the best approximation of full cost per academic programs for McMaster in that year based upon procedures agreed upon as logical and equitable. When studied in this light, the weights can be seen as indicators of past decisions and aids to future policy formulation.

3. The omission of Health Sciences from the study can create a false impression of the costliness of non-professional undergraduate programs relative to the professional and graduate programs.

At the time of the 1972-73 expenditure analysis the Health Sciences faculty was only in its second year of full operations. Because of the extraordinary costs associated with its inception which included facility expansion and faculty recruitment, it was deemed unfeasible to include the Health Sciences in the cost study. As appendix I shows the inclusion of Health Sciences would have made no difference in the deficit experienced by the professional and graduate programs in that year. Health Sciences received a provincial start-up grant in 1972-73 which brought the Faculty into a break-even position. Since that time, however, the provincial grant has expired and the faculty has had about a \$1,000,000 deficit in both 1974-75 and 1975-76. Because of the high costs of the Health Sciences faculty, the graduate and professional programs are experiencing a greater deficit than they previously did.

The McMaster weights in the 1972-73 expenditure analysis do not take account of the impact of the Health Sciences faculty on the overall university operations. Since the purpose of the cost study was to approximate the full cost of academic programs and to determine overhead costs for instruction and research and not to compare

the costs of non-professional programs with those of professional and graduate programs, the inclusion of Health Sciences was considered irrelevant. In order to assess the relative positions of non-professional undergraduate programs and graduate and professional programs, the Health Sciences faculty must be considered. Because of the large deficits experienced by Health Sciences, any surplus of non-formula funds which professional and graduate programs experienced has been more than absorbed.

4. The differences between the McMaster and M.C.U. weights represent a series of policy decisions to allocate resources in a certain manner.

The ways that a university decides to expend its funds is an individual decision based upon the philosophy of the university. Certain priorities are given to areas of strength or to those areas in which strength is developing. An individual cost study can show deviations from the formula weights which have resulted from such priority funding. Since universities are non-profit organizations, their financial objective is to live within their budget. If their financial management is sound, and expected funds are received, then the university can normally meet its expenses. In the event of unexpected economic happenings such as the current inflationary spiral, difficulties in maintaining a budget may occur which require financial reorientation, and may, to a certain extent, cause certain long-term priorities to be sacrificed to meet short-term expenses.

In most cases the McMaster weights derived from the 1972-73 cost study are greater than the M.C.U. weights. Because of this difference in weights deficits are created for both the undergraduate non-professional and the graduate and professional programs. These deficits are 6% of expenses for the non-professional undergraduate programs and 10% of expenses for the professional undergraduate programs which when combined with the 2% surplus for graduate programs produces a joint deficit of 2%. As the reconciliation in Appendix I shows, these differences are eliminated through the use of non-formula funds.

In order to estimate cost per student for academic programs a series of cost studies need to be undertaken. With such a longitudinal approach a costing model for an individual university could be derived to predict costs under simulated changes in the variables. To compare costs of programs, cooperative cost studies must be

performed and information exchanged among universities. Such exchange would allow a cross-sectional study of program weights and would encourage the recognition of the unique differences of resource allocations among universities. Both types of studies are necessary to evaluate the equity of formula funding. A single study by a single university such as McMaster performed in its 1972-73 expenditure analysis can not be assumed to provide such data. Rather, the 1972-73 weights represent the historical costs of programs for that year, costs which were budgeted at the level that they were because of McMaster's decision to do so.

Conclusion

McMaster's 1972-73 expenditure analysis and the follow-up studies which were done in conjunction with it have proven valuable managerial tools for the university. By estimating the portion of overhead that should be charged to research, by isolating the various overhead charges to academic programs, rational evaluation of such costs can be undertaken. Although there are limitations to the study because of the cost allocation procedure and the nature of historical costs, its benefits for university management are great. The data must be interpreted carefully and the results can not be generalized beyond the scope proposed in the study.

APPENDIX II
Reconciliation of Difference
Between McMaster Weights and M.C.U. Weights
for the 1972/73 Expenditure Analysis
(Excludes Health Sciences¹)

Non-professional undergraduate Programs (Full-Time)

Expenditures per McMaster Weights	\$13,378,701
Income per M.C.U. Weights	<u>11,694,008</u>
Excess of expense over income	\$1,684,693

Non-professional undergraduate Programs (Part-Time)

Expenditures per McMaster Weights	\$ 1,679,267
Income per M.C.U. Weights	<u>2,513,360</u>
Excess of income over expense	<u>(834,093)</u>
Total Non-professional undergraduate deficit	<u>\$ 850,600</u>

Professional Undergraduate programs
(Engineering, Commerce, Social Work)

Expenditures per McMaster Weights	\$ 4,954,532
Income per M.C.U. Weights	<u>4,455,743</u>
Excess of expense over income	498,789

Graduate programs

Expenditures per McMaster Weights	\$ 8,852,305
Income per M.C.U. Weights	<u>9,031,482</u>
Excess of income over expense	<u>\$ (179,177)</u>

¹The 1972/73 cost study did not include Health Sciences. In that year because of a provincial start-up grant, the faculty broke even. This grant has since expired and Health Sciences in 1975/76 will incur a deficit of approximately \$1,000,000 which will need to be offset by non-formula funds.

Total professional and graduate deficit	<u>319,612</u>
Combined university deficit	\$1,170,212
Non-formula income (excluding Health Sciences)	<u>\$1,579,149</u>
Total university surplus	<u>\$ 408,937</u>

Distribution of Non-formula Funds

	<u>F.T.E. Enrolment</u>	<u>B.I.U. Weighting</u>
Non-professional undergrad	\$1,105,404	810,135
Professional and graduate	<u>473,745</u>	<u>769,014</u>
Total distributed	<u>\$1,579,149</u>	<u>\$1,579,149</u>

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